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AVIATION

APRIL 9, 1923 Issued Weekly PRICE 10 CENTS

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VOLUME XIV

Number 15

SPECIAL FEATURES

GERMAN AIR ACTIVITIES AND LATIN AMERICA

THE LACIERVA "AUTOGIRO" FLYING MACHINE

THE OEHMICHEN-PEUGEOT HELICOPTER DESCRIBED

AMERICAN PILOTS MAKE NEW WORLD'S SPEED RECORDS

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HIGHLAND, N. Y.
225 FOURTH AVENUE, NEW YORK

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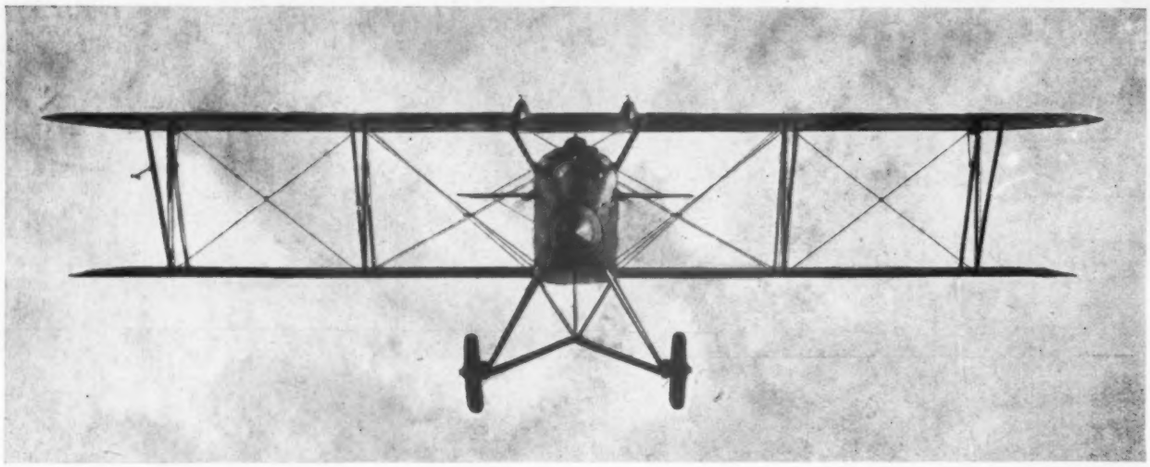

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AVIATION

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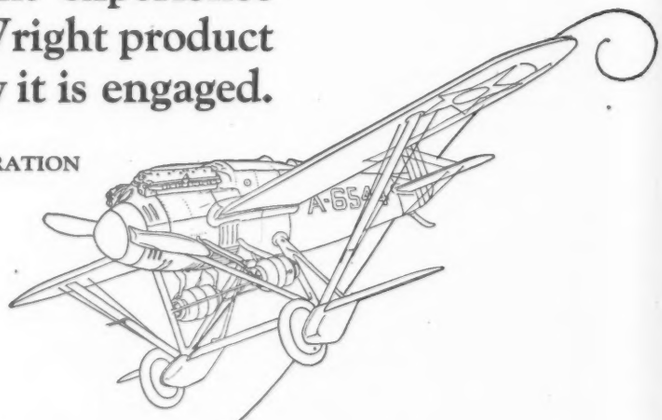

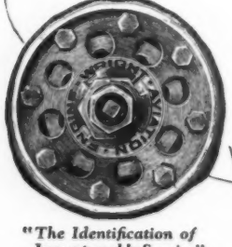

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The Lacierva "Autogiro"

THE Lacierva "Autogiro" which is described in this issue offers unusual interest from the military, and more so even from the naval, point of view. While at first sight there is the temptation to call the machine an engineering freak, this may well be a hasty judgment. One fact stands out: the machine has flown horizontally, apparently well under control, banking automatically on turns, and it has landed with practically no forward velocity. That its speed was moderate for the horsepower employed and the load carried is hardly astonishing in view of the fact that this was an experimental machine.

It is to be presumed that the trials of the Autogiro took place under the most favorable weather conditions, hence the machine has still to demonstrate how it behaves in gusty air, which may affect its automatic lateral stabilty. Conclusive evidence as to the inherent qualities of the Autogiro will only be had after very extensive operation under all kinds of conditions, and the trials will be looked forward to with considerable interest.

In the meantime some speculations with regard to the practical value of such "gyroplanes" seems timely. That the gyroplane may displace the airplane for civil and military purposes, is not likely unless the gyroplane can equal the performance of an equivalent airplane and still possess the feature of landing without forward velocity—which seems doubtful. This is really the whole crux of the problem of aviation. Variable camber wings, Fairey flaps, Handley Page slotted wings and variable wing area devices all endeavor to make the airplane land at the lowest possible speed without diminishing its high-speed in flight, for the latter is the main advantage the flying machine possesses over other vehicles. All these devices have achieved a certain measure of success, but the drawbacks they also embody have so far prevented their general use.

What the gyroplane may accomplish, however, if further experiments demonstrate its practical value, is to diminish to a considerable extent the present enthusiasm for the helicopter. The *raison d'être* of the helicopter is not so much its ability to "lift off" vertically from the ground as its—yet assumed—ability to land vertically, that is, without forward velocity. Airplane accidents happen mostly on landing at high speed on uneven ground, whereas take-off accidents are extremely rare. Hence, if there existed a flying machine that would take off like an airplane and land like a helicopter, the need for the latter type of machine would disappear, although orthodox airplanes might and probably would still be needed for many purposes.

From the military viewpoint gyroplanes would be extremely valuable for landing in restricted places, such as near the front lines where no flying fields can be laid out, or on board ship. A flying machine that could be shot into the air from a catapult and that would land with no forward velocity on the deck of an aircraft carrier would solve one of the most difficult problems of naval aviation. This possibility should not be overlooked by our naval authorities, for even though gyroplanes may not be adapted for fighting on account of their inherent stability, they may prove very useful for observation.

New York to Newport Air Line

THE anouncement that a flying boat service for passengers will operate on schedule, next summer, between New York and Newport will be welcomed by all those who are interested in the development of air transport by means of up-to-date aircraft.

AVIATION has steadfastly maintained that air transport cannot be made a business proposition without aircraft specially designed for the purpose, and that the use of converted war aircraft could not but be a temporary expedient. We also believe that, far from supplanting any other means of transport aircraft will create a *clientèle* of its own, one whose time is so valuable that they will be ready to pay the necessary high rate charged for high speed transport if it is safe and reasonably comfortable.

The past performances of the Loening air yacht, which type is to be used on the New York to Newport service, are a brief that these conditions will be fulfilled, and augur well for the success of the new air line.

American Aviation to the Fore

IT is a gratifying indication of the genius of American aviation that no sooner were the new speed records over recognized distances made by French pilots known in this country than the Army Air Service went out and bettered them in a brilliant display at McCook Field. While the maximum speed, duration and distance records have not yet been brought back to America, we may rest assured that the Air Service will do its utmost to bring about this result.

The Air Service thus establishes the doctrine that every aviation record which does not belong to America should be competed for until it is brought back to the country which gave the world the flying machine. We should like to see the Air Service also go after the airship records, all of which are ten years old and could handsomely be beaten.

"If war were declared to-morrow what would we do for aircraft?"

German Air Activities and Latin America

Air Combine Allied with German Shipping Interests Enters Field of World Contest

By Ladislas d'Orcy

According to latest information on hand, the merger of German air lines which was briefly reported in these columns, was even more comprehensive than indicated in the brief press dispatches.

The new air line combine, which is known as the Aero Lloyd A. G., with headquarters at Berlin, includes not only the Deutsche Luftreederei, the Deutsche Luft-Lloyd and the Luftverkehr Sablatnig, but also the Lloyd-Junkers Luftverkehr, formerly known as the Lloyd-Ostflug. The capital of the German Aero Lloyd is 100 million Marks.

Plans of the German Aero Lloyd

The Hamburg American Line, the North German Lloyd, and the Allgemeine Elekrizitaets Gesellschaft are all financially interested in the new concern which merges practically all the German air lines in a powerful corporation. The only remaining independent air line in Germany is the German-Russian Air Line, which is incorporated in Berlin and operates under Russion registry airplanes of Dutch manufacture fitted with British engines and piloted by Germans. This air line operates a daily mail and passenger service between Koenigsberg, East Prussia, and Moscow, Russia.

The plans of the German Aero Lloyd for the 1923 season are very extensive. Not less than eleven airways are to be operated by this company, and the clever business methods of the German shipping interests may be seen in the agreements which the German Aero Lloyd has reached with several foreign air lines for operating some airways in common.

The Berlin-Cologne-London route is to be operated in common with the Daimler Airway, a British firm; the Berlin-Hamburg-Copenhagen route with a Danish Air Line; the Berlin-Dresden-Prague route with a Czechoslovakian Air Line; the Danzig-Koenigsberg-Memel-Riga route with the Danziger Luftpost; and the Nurnberg-Stuttgart-Konstanz-Geneva route with the Ad Astra, a Swiss concern. That these agreements will powerfully second the interests of the German aircraft industry is obvious, for on one hand the passenger and freight rates will be based on a single schedule, which will exclude ruinous competition, while on the other hand, the foreign air lines which have no home industry from which to draw modern aircraft will gradually become the customers of the German aircraft industry.

In addition to the international airways above mentioned, the German Aero Lloyd will operate services on the following routes: Berlin-Bremen-Wangerooge-Norderney; Hamburg-Stettin; Hamburg-Westerland; Berlin-Stettin-Danzig-Koenigsberg-Kovno-Riga; Berlin-Leipzig-Nurnberg-Munich-Konstanz; Bremen-Hannover-Magdeburg-Leipzig-Dresden.

The German civil air department has announced, in this connection, that it will subsidize only those airway services which will use cabin airplanes. German-made machines coming under this head include the Junkers and Dornier cantilever monoplanes, both of which are now fitted with the 180 hp. B.M.W. low compression type engine, and carry four or five passengers beside the pilot. Only the Junkers is actually manufactured in Germany, for the Dornier airplanes are only designed there, and fabricated in Switzerland and Italy, where the Dornier interests acquired factories. The Junkers firm is also organizing a large factory in Russia, while Paul Rohrbach, formerly engineer with the Zeppelin airplane branch, has organized a Danish manufacturing company, and Brandenburg seaplanes are produced to German designs in Norway. The Albatros company of Berlin recently brought out a cantilever cabin monoplane for five passengers, fitted with the 285 hp. Rolls-Royce "Falcon" engine.

Nothing definite is as yet known regarding the proposed Spain to South America airship service of the Zeppelin Company, which under the terms of the peace treaty cannot build airships of more than 30,000 cu. meters capacity. As the plans provide for airships of 135,000 cu. meters capacity, it is probable that the ships will be built in Spain to the designs of the German Zeppelin plant, or perhaps parts will be fabricated in Germany and the ships assembled in Spain.

The German aircraft industry is also extremely active in Latin America. Our readers are familiar with the introduction of Junkers seaplanes in Colombia, where they are operated by a German-Colombian company. But this venture only appears to be the forerunner of more extended German aircraft expansion in Latin America.

From Havana to Buenos Aires

A recent Naval Aviation report furnishes the interesting information that two German Junkers seaplanes are enroute from Havana, Cuba, to Buenos Aires, Argentine Republic, with a view to laying out a coastal airway between these two cities. The flight is in charge of E. R. Hahn Echenagucia, representing the Junkers Airplane Company.

The two seaplanes, bearing the German registration marks D-217 and D-218, were shipped from Germany to Havana and set up there. Leaving Havana on Jan. 23, the two ships stopped at various points on the Cuban coast and at Port-au-Prince, Haiti, and reached Santo Domingo City on Jan. 27 in 11 hr. flying time.

The Germans decided to make a direct flight from Santo Domingo to Venezuela instead of following the Lesser Antilles to the South American continent, as Lieutenant Hinton had done. This necessitated crossing a 600 mile stretch of open water containing no islands or steamship routes. The two seaplanes left Santo Domingo City early in the morning of Jan. 30, and a cable received some days later stated that they had landed at Caracas, Venezuela, after a flight of 8 hr. 45 min., and were proceeding down the coast.

The planes are identical with the Junkers all-metal monoplanes purchased by the American Government and are fitted with two small pontoons. No wing tip pontoons are used. The latest type B.M.W. 180 hp. engines are installed, which have several improvements over those in use in the United States and which, they said, were built by Junkers. Straight benzol was used as fuel and each plane carried enough for fourteen hours flying.

The new 180 hp. B.M.W. engine differs from the model 3A used on the Junkers machines flown in this country principally in that it has no supercompression device. This has been suppressed on the new model to make the engine conform to the decisions of the Council of Ambassadors.

It is possible that this flight has some connection with a proposed Brazilian airway service which is announced in a recent issue of *Tohtli*. Our contemporary states that a Brazilian air line was recently incorporated in Rio de Janeiro for the purpose of operating mail and passenger services between that city and Pernambuco, with a possible extension northward toward the Amazon, and southward to Buenos Aires, Argentine Republic. This company is to employ Junkers cabin machines.

Finally, in Mexico, the Commercial Aviation Section of Department of Communications and Public Works is considering a request for a concession to operate a public air service between Vera Cruz and Progreso which was submitted to it by the Mexican representative of the Junkers firm.

It will be seen from the above that the German aircraft in-

dustry is very active at home as well as abroad despite the fact that its wings were badly clipped by the peace treaty.

Looking at a map and putting two and two together, it is not difficult to visualize a nominally South American, but actually German, air line which would connect the principal cities of the Southern continent and reach up through Mexico to this country. The Colombian line may be the first link of the chain; the Brazilian and Mexican services would be additional links of the great North and South American trunk airway which would gather the air borne business of tomorrow for the benefit of German manufacturers.

Long View of the Future

All this may seem very fanciful, but it is merely taking a long view of the future. The close connection which exists between the newly formed German Aero Lloyd and the principal German shipping firms warrants the assumption that the former will have at its disposal the best business brains and connections of the latter. What this means will be understood by those who have studied the expansion of German maritime traffic in South America, where despite the war and the blockade German shipping is making immense strides in a tenacious effort to retrieve its former dominant position. In this connection it is significant that the first advertisement of the German Aero Lloyd states among others that full particulars regarding its services will be found in all agencies of the Hamburg-America Line and the North German Lloyd.

American aircraft manufacturers are terribly handicapped in South America by the exchange, the dollar being at a premium, whereas the almost hypothetical value of the Mark favors the importation of German aircraft—carried on German shipping—to the extreme. That is only one of the handicaps experienced by the American manufacturer. Another one is that he has to fight his way through practically unaided for the lack of business solidarity between the various American enterprises, whereas the German manufacturer arrives backed by his national steamship company, which backing extends well inshore and once he is landed the spirit of solidarity of the Germans together with their intimate knowledge of local customs and conditions gives him the most valuable assistance.

Intercontinental Flying

It seems reasonable to assume that intercontinental air transport will come into being between North and South America long before it will between either and Europe. The 2000 miles between Newfoundland and Ireland on one hand, and between Pernambuco and Dakar on the other, will for some time—five years at least—constitute a serious obstacle to air transport between Europe and the two Americas. Within five years there may exist airships which will negotiate that distance with a reasonably remunerative pay load to warrant the establishment of such a service, but it seems doubtful that airplanes will be capable of doing it before ten or more years.

But between North and South America no such geographical handicaps exist. Undoubtedly there are coast lines of several hundred miles in South America that would require very careful surveying and an elaborate ground organization to make air navigation safe; but there are no great distances to be flown out of sight of land. The fact that Walter Hinton succeeded in flying from New York to Rio de Janeiro in a flying boat of antiquated design and doubtful qualities was a *tour de force* which is all to the credit of his grit and skill; but it also proves, by negative inference, that an up to date machine could make that trip in a reasonable amount of time and without encountering unusual difficulties.

Common Sense in Air Transport

It is often said that air transport does not pay, else no government would spend money on subsidizing air lines, as is done all over Europe. Like all generalizations, this statement is altogether too sweeping.

Aerial passenger transport does not pay, it is true. But nor does passenger transport by rail or by sea. It is not the thousands of passengers that enable steamship lines to operate palatial ocean liners—it is the freight carriers, the "tramps." The "Twentieth Century Limited" which runs between New York and Chicago could not be maintained on the passenger fares—what pays for it are the innumerable freight trains. Passengers form the most wasteful transport units, for they require high speed and comfort, both factors which spell inefficiency from the revenue earning viewpoint.

And yet, for three years the European air lines, disregarding a hundred years of railroad and shipping experience, did all in their power to attract the traveling public and almost disregarded freight and mails. It is only recently that this truth has been realized abroad and now many foreign air lines are turning their chief attention toward obtaining freight for their services. Likewise the carrying of mails by air has been very little developed in Europe. In this country the splendid showing of the Air Mail Service should spur us on to extend its activities beyond the national boundaries.

An air mail service between New York, Havana, Rio de Janeiro and Buenos Aires, which is bound to be a reality in the near future, may seem at present an immense undertaking. However that be, let us remember that if we don't do it, somebody else will eventually. In the meantime we should make a beginning toward creating a Pan-American air mail service by running an overland air line from either New York or preferably St. Louis to Mexico City. The 2400 miles from New York to Mexico City could easily be covered in a day and a half, which would mean a saving of more than three days on the best railroad time. From Mexico City the air line could be extended through Central America down to Panama, which would give us rapid communications with the Canal Zone. Mexico and the six Central American governments would probably be sufficiently interested in such a service to grant it either subsidies or a mail franchise on the order of the Colombian scheme.

South America as a Market

Let us keep an eye on South America. If the situation is intelligently handled, that continent—and Mexico too—may become the best foreign customer of our aircraft industry. There are no expensive steamer freight rates for aircraft destined to Mexico, for there already exists an airway between Laredo and Mexico City which even a "Jennie" could negotiate. Some have, as a matter of fact. With respect to South America delivery of aircraft by air is not so easy, save where flying boats are concerned. But seaplanes are the very kind of aircraft which are needed in South America: on one hand, the principal cities are all situated on waterways or on the coast; on the other hand, the hinterland is frequently unfliable, being covered by virgin forests, as in Brazil, or by treacherous mountains, such as the Andes. Hence, it is the commercial flying boat which we should develop for South American use, just as we should push the development of commercial land planes for use in North America.

Let us keep an eye on South America. The future prosperity of the American aircraft industry may to a large extent depend upon it.

Cincinnati Airport

The Cincinnati airport, Grisard Field, is rapidly taking form. This field is located at Blue Ash on the C. L. and N. Railroad and thirteen miles north-east of the city of Cincinnati. It is to be used by the 325th Observation and 417th Pursuit Squadrons. Capt. Donald P. Muse, A.S., will command.

Hangars are now being erected and will be completed about April 15. Six ships are assigned and are to be delivered from Wilbur Wright Field about May 1. Tentative plans have been made for erection of a hospital. A flight surgeon and medical detachment will be stationed at the field.

Lt. John A. Macready was a guest at a luncheon given by the Air Service Reserve Officers at the Chamber of Commerce on March 20. He spoke on aviation from a test pilot's point of view and concluded with a detailed and vivid description of the endurance and distance record flights by Lieutenant Kelly and himself last fall.

"If war were declared to-morrow what would we do for aircraft?"

American Pilots Make New World's Speed Records

Lieut. R. L. Maughan Exceeds Sadi Lecointe's Speed

The Franco-American contest for the world's maximum speed record continues. As our readers will remember, it started Oct. 16, 1922, at Selfridge Field, Mount Clemens, Mich., when Brig. Gen. William Mitchell flying an Army-Curtiss racer fitted with the 460 hp. Curtiss D12 super-compressed engine made a world's speed record of 222.97 m.p.h. (358.836 km.p.h.). The previous record was 212.055 m.p.h. (341.239 km.p.h.), made by Sadi Lecointe on a Nieuport-Delage racer (340 hp. Hispano engine) at Villesauvage, France, Sept. 26, 1922.

General Mitchell's record was first homologated by the National Aeronautic Association as 224.38 m.p.h. and this figure was submitted to the International Aeronautic Federation for official cognizance. Upon examination of the relative documents it was found by the F.A.I. that General Mitchell's record had been calculated as the average of the four *times* made over the one kilometer course instead of as the average of the four *speeds*, as the F.A.I. rules provide. As a consequence General Mitchell's performance was corrected to read 222.97 m.p.h., which explains the discrepancy often found in references to his performance.

General Mitchell's performance remained the world's record until Feb. 15, 1923, when Sadi Lecointe after numerous attempts made at Istres, France, established a new record with 233.025 m.p.h. (375 km.p.h.) As soon as this performance was homologated by the Aero Club of France, the U. S. Army Air Service started preparations for winning back the coveted record. The two Army-Curtiss racers which finished first and second in the last Pulitzer race, and on which General Mitchell made his world's record, were put in shape at Dayton, Ohio, and a one-kilometer course was established at Wilbur Wright Field. Preparations were hastened so as to make the speed trials before April 1, after which date the new ruling of the F.A.I. providing that maximum speed trials be flown over a three-kilometer course will be in force. Beginning April 1, 1923, also, maximum speed records will be homologated only if made over courses officially approved by the F.A.I. This ruling was made at the F.A.I. conference held in Rome in 1922, and all federated clubs have been notified to that effect.

Attempts for Maximum Speed

The last week of March Lieut. R. L. Maughan, A.S., winner of the 1922 Pulitzer Trophy race, and Lieut. L. J. Maitland, A.S., who finished second in that race, made at Dayton repeated attempts to win back the speed record.

On March 26 Lieutenant Maughan covered the kilometer course in 9.45, 9.71. 9.54 and 9.56 sec., respectively, making an average speed for the four laps of 233.87 m.p.h., as given out by the contest officials of the National Aeronautic Association. This figure beats Sadi Lecointe's record by about eight-tenths of a mile, but it cannot be homologated as a new world's record, for the F.A.I. rules provide (Aero Club Rule Book, p. 158) that "existing speed records can only be beaten by the minimum difference of 4 km. (2.485 miles) per hour." Furthermore, contest officials were reluctant officially to record Lieutenant Maughan's mark as the chronograph tape of the electric timing device showed a deflection and figures were blurred.

On March 29 Lieutenant Maitland was reported in press dispatches to have broken Sadi Lecointe's record by making an average of 243 m.p.h. It appears however that this speed was obtained by diving into the course, for the pilot is quoted as saying: "Well, I guess there is nothing to it except which one is the biggest fool and takes the highest dive. That's where I got most of my speed." According to the New York *Times*, Maughan rose to a height of several thousand feet and diving down straightened out at about 60 ft. above the ground and raced over the kilometer course. Evidently such a performance does not count for the world's maximum speed record, for diving into the course is distinctly prohibited in the F.A.I. rules.

Speed over Recognized Distances

New world's speed records for the recognized distances of 500 and 1000 kilometers were made on March 30, over a measured 50 kilometer course between Villesauvage airport, near Etampes, and La Marmogne, France. Lieutenant Batelier flew 500 kilometers (ten laps of the course) in 2 hr. 42 min. 51⅗ sec., making an average of about 114 m.p.h. The existing world's record for this distance was 3 hr. 35 min. 36⅖ sec., and was made by Lieutenant Bossoutrot on a Farman F90. The same day (March 30, 1923) Lieutenant Carrier flew 1000 kilometers (twenty laps of the course) in 6 hr. 39 min. 40⅖ sec., making an average speed of about 93 m.p.h. and beating the record jointly made by Bossoutrot and Bernard on June 3-4, 1920, on a Farman Goliath, which was 10 hr. 19 min. 46 sec.

No sooner had the cable brought the news of these records to America than they were broken, on March 31, by American pilots in a spectacular aerial derby held at McCook Field, Dayton, Ohio.

Eleven ships took the air soon after one o'clock in an effort to best the French records. Seven were to try for the 500 kilometer mark and five for the 1,000. Five of the planes finished the 500 kilometer distance and four of the others were forced down.

Aviators who beat the French record for 500 kilometers and their times are:

Lieut. Alexander Pierson, (Verville-Sperry) 1 hr. 50 min. 12.7 sec., average speed about 169 m.p.h.

Louis Meister, (DH4B) 2 hr. 32 min. 48.44 sec., average speed of 127 m.p.h.

Lieut. Arthur Smith (Lepère) 2 hr. 32 min. 31.88 sec., average speed of 122.1 m.p.h.

Lieut. H. H. Mills, 2 hr. 36 min. 26.69 sec., averaging 119.2 m.p.h.

Lieut. J. S. Stromme, who went the distance in 2 hr. 42 min. 35.48 sec., at 114.7 m.p.h.

Lieut. Harold Harris and Ralph Lockwood, civilian pilot covered in a DH4B 1000 kilometers in 4 hr. 52 min. 35.24 sec., averaging about 126 m.p.h. Their time for 500 kilometers was 2 hr. 26 min. 39.9 sec.

The air circus was completed without a serious mishap. The planes that were forced down suffered mostly from engine trouble. Smith smashed a wheel in landing after being forced down by a broken support wire.

Thrills of the day were furnished by Pearson, who flew a Verville-Sperry ship. Taking off last, after a "barrel" roll at the start nearly made him crash, Pearson steadily crept up on the leaders and soon was setting the pace.

Load Carrying (Altitude)

The world's load carrying record (altitude) which Jean Casale made Feb. 12, last, at Buc, France, when he reached a height of 4791 meters with a useful load of 500 kilograms, was twice beaten in the last few weeks. On March 2, Lieutenant André, of the French air force, made a new record on a Breguet 17C2 (420 hp. Renault engine) by climbing with the same load to a height of 5600 meters (368 mm. mercury). On March 12 this record was beaten in its turn by the French pilot Thierry, at Cuatro Vientos, near Madrid, Spain, who climbed with a useful load of 500 kilograms to a height of 5992 meters (348 mm. mercury). The performance was made on a Breguet 19A2, and has been homologated as a world's record by the Royal Aero Club of Spain.

"If war were declared to-morrow what would we do for aircraft?"

New Type of Flying Machine–The Lacierva "Autogiro"

By Heraclio Alfaro

In the past few weeks the Spanish aeronautical world has witnessed some highly interesting experiments with a new type flying machine which its inventor, Juan Lacierva, calls an "autogiro." A close-up view of this machine appeared on the cover of AVIATION for March 12, 1923, while the accompanying illustration shows the machine in flight.

In a series of tests conducted at Cuatro Vientos Airport, near Madrid, by Lieut. A. Spencer of the Spanish army, the Lacierva Autogiro left the ground easily, made turns around the field and landed smoothly. Its most interesting feature is its ability to land with practically no forward speed, the engine being shut off. The experiments showed that the Autogiro has remarkable stability, for it can be flown without the assistance of any lateral control (ailerons), and the elevator controls could be locked for any length of time without influencing the behavior of the machine.

The Autogiro Is Not a Helicopter

The Autogiro is not, as the first newspaper dispatches stated, a helicopter. In fact, the machine is based on principles entirely different from those followed in the construction

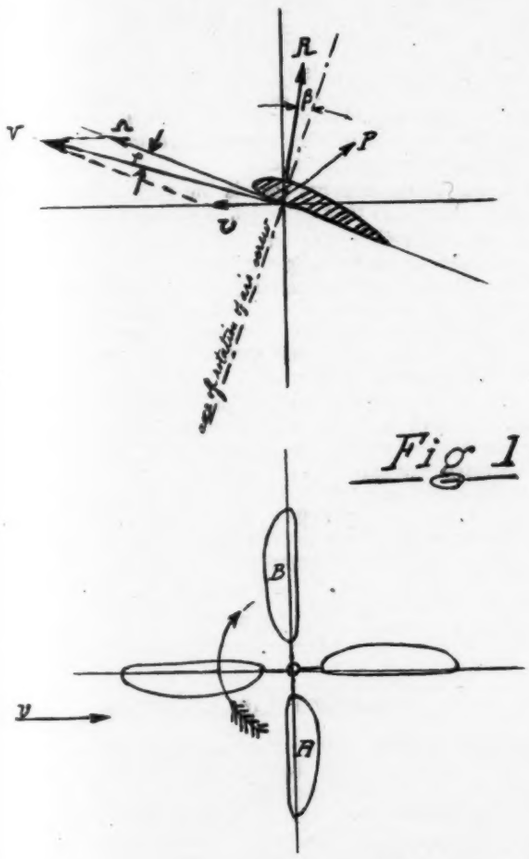

Fig 1

Fig. 1. Theory of the Lacierva "Autogiro" flying machine

of helicopters as well as of airplanes. A helicopter is sustained in flight by a lifting screw which an engine causes to rotate in a horizontal plane and it "lifts off" vertically. In the Autogiro, on the contrary, the big four-bladed screw which is mounted on a vertical shaft fixed on the fuselage is not actuated by any power plant, but instead it is made to turn freely on its bearings. Consequently this "screw" is actually a wind vane which operates like the little propellers used to actuate the fuel pumps of aircraft engines, that is, it is the relative wind created by the forward motion of the airplane which causes it to rotate.

On the Autogiro the big wind vane is mounted in ball bearings and is not controled in any manner by the pilot. The blades of the vane are set at a fixed angle of incidence relative to the axis of rotation, but they are hinged to the bearing

Fig. 2. The Lacierva "Autogiro" in flight

shaft in such way that in flight they place themselves in the resultant of their lift and centrifugal force.

The rest of the machine is an ordinary tractor airplane, with an 80 hp. Le Rhône engine and tractor propeller, and the customary tail surfaces aft. The experimental model flown near Madrid, was fitted with two very small wings with ailerons to safeguard the pilot against unexpected occurrences, but the experiments proved that this precaution was unnecessary, for the machine did not require lateral means of control. The Autogiro was found to take automatically its correct bank on turns, for the hinged connection of the blades of the vane keeps the plane of rotation always at right angles with the bearing shaft, and this despite the gyroscopic effect. Therefore the stability is automatically insured on turns.

Principles of the Autogiro

It is known from experiments that when a stationary airscrew is exposed to an air current, the blades being in position *A* (Fig. 1), have a resultant *R* which makes an angle with the airscrew shaft. The resultant *P* of the opposite blade (position *B*) has always a smaller angle than *A* or is negative. Therefore a rotation is established by the airscrew in the sense of the arrow. The speed of rotation will increase until the resultant of *R* and *P* is parallel to the axis of rotation of the airscrew. The whole lifting body does not transmit to its shaft any torque except the one produced by the friction of the bearings, which can be neglected, eliminating therefore the necessity of using two propellers.

However, the resultant velocity of the blades relative to the air in position *A* is greater than in *B* and its lift will be

"If war were declared to-morrow what would we do for aircraft?"

greater also. Therefore, the total resultant of this airscrew will not pass through its center and the whole system will tend to bank. This banking effect has been overcome in the Autogiro by fixing the blades to the shaft by means of a hinge, which permits them to set themselves automatically in the resultant position of the centrifugal force and lift. In such a way, blades *A* will bank slightly, while blades *B* will remain horizontal and the total resultant of the lifting airscrew will always pass through its center.

If we analyze the effect of the hinged blades of the vane, we see that the shaft can freely change its angle with the plane of rotation of the blades, but that the blades have a strong tendency to return to their original position relative to the shaft. This gives an automatically perfect banking in the turns and stability in flying.

The velocity of the blades relative to the air is much greater than the translational speed of the whole machine. The angle of attack is a function of the translational speed of the machine and the angle between its direction of motion and the plane of rotation of the blades. This allows a much greater range of speeds and angles of flying to the whole machine, and will permit landings in very small spaces without horizontal motion.

The Autogiro weighs about 880 lb. empty and 1100 lb. loaded. The horizontal speed attained is from 38 to 55 m.p.h. The rotational speed of the lifting vane is about 140 r.p.m. in horizontal flight. The descending speed in verical landings is of about 6-10 ft. per second.

The Inventor and the Pilot

Mr. Lacierva, Jr., is 27 years old, and comes from one of the oldest and best families of Madrid. He is the son of one of the most popular Spanish political figures who has been several times Minister of the Interior, Minister of War and Minister of Finances, being at present the chief of a Spanish political group. He is a graduated engineer and has built successfully several airplanes since 1912. He started to work on his first Autogiro in 1920. The present machine is his fouth attempt.

The tests have been carried out by Lieut. Alejandro G. Spencer, Spanish Air Service. Lieutenant Spencer comes from an old English family who came to Sevilla years ago. He is one of the most popular pilots of the Spanish Air Service, and has been a teacher in the Getafe Army Flying School for aerobatic flying.

Two Letters

Editor, AVIATION:—

It is very gratifying to receive your letter of March 7, with reference to my recent article in the Saturday Evening Post, entitled, "Air to Let". Your criticisms are constructive and very helpful.

The one thing in which, of course, as a lawyer, I am primarily interested is the subject of federal legislation governing aeronautics. The industry can never go ahead, nor can we as a country equal the performance of foreign countries along aeronautical lines until we have federal legislation governing this new means of transportation.

In my judgment, the one outstanding result of the World War has been the advancement of aviation; and there seems to be an entire lack of understanding on the part of members of Congress with regard to the necessity of legislation on the subject of federal control of aeronautics.

It was not my intention in the Saturday Evening Post article to give the impression that there is a lack of interest in aviation in general. There is a very keen interest in the subject throughout this country; but there is a lack of interest on the part of Congress in laying the ground-work for the protection of private capital in its investment.

The question of subsidies to which you refer, will be discussed in detail in a series of articles on European aviation which I have written for the Hearst newspapers. These articles will begin appearing in April in the Sunday edition of the Hearst papers throughout the country, and will later be published in book form.

I note what you say in regard to the super-charger, and the fact that I credited its development to the McCook Field. I did not intend to overlook the inventors, or the fact that this is a development of the General Electric Co.

In one of the above articles on European aviation, and the application of European discoveries to American problems, I have called attention to the splendid work which the Dayton-Wright Co. have done in the training of civilian pilots, and the remarkably short time in which they have achieved satisfactory results. I agree with you that it is very easy to learn to fly, and the actual ability to fly can be developed in a very few hours.

I think you will realize that my one purpose in the Saturday Evening Post article was to emphasize the necessity of federal legislation for aeronautics. In as much as any legal subject is rather heavy, I tried to make the desired impression on the reading public through the medium of a story of the development of aviation treated in narrative form rather than by an argument for this legislation in the usual legal form.

W. JEFFERSON DAVIS
San Diego, Calif., March 17, 1923

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Editor, AVIATION:—

I wish to call your attention to the first article in The American Legion Weekly of March 2, 1922, entitled "The Peace Time Aviator." I will venture to say that this article has done more to tear down aeronauties in the eyes of its readers, than the Roma or ZR2 accidents. Every subscriber to this magazine probably read this article; and it is safe to say that not one of them would care to ride in or trust his possessions to an airplane.

It is this public support that is the very life blood of the flying industry, and that of which it is in such a need today.

I think this article was written solely through prejudice. The percentages are built up the same way soap bubbles are; and are not true of the conditions as they exist today. I think that the majority of the deaths, which the author has so cleverly juggled in to such astounding figures, were caused by the performance of daring stunts; and should not be used as a guillotine for aviation.

It is no wonder that the national aviation bills are not passed. It will probably take a great deal of work to win back the readers of this exaggerated work of prejudice. If more constructive articles were printed in our newspapers and magazines aviation would make faster progress. Also if more of our aeronautical enthusiasts, instead of reading and weeping, would really get out and boost—the general public would secure the correct views regarding aviation.

RUSSELL OLSON
Minneapolis, Minn. March 4, 1923

Canadian Air Activities

A large all-metal passenger monoplane with five occupants arrived at Toronto, Ont. from Detroit March 21. The machine is said to be the forerunner of a regular passenger and freight service between Chicago, Detroit, Toronto and Ottawa.

Each airplane to be installed on the route will carry twelve passengers and 4000 lb. of freight. Toronto will be the base of operations with a scheduled five-hour flight to Chicago.

An air mail service between Prince Edward Island and New Brunswick is also under consideration. Residents of the province are said to have received favorably a proposition for such service advanced on a recent visit to the island by Harry D. Wilshire, Montreal pilot, who is connected with the Laurentide Air Service, Ltd.

"If war were declared to-morrow what would we do for aircraft?"

The Oehmichen-Peugeot Helicopter

A Machine which Embodies some Unusual Features

The second helicopter designed and built by Etienne Oehmichen, with which flights up to 2½ min. duration and 250 ft. distance have been accomplished, is a great improvement over his first one. The inventor hopes to meet with this machine the tests imposed by the Engineering Division of the French Air Service, which comprise sustention of five minutes duration in the air, and a complete circuit in flight at low altitude. When these tests will have been met, another machine will be built for which plans have already been drawn up, and with which M. Oehmichen hopes to make safe descents, with the engine stopped.

The machine consists of a framework of duralumin tubing, forming a cross with unequal arms. The greater axis, or longitudinal axis is the keel of the machine, and indicates its principal direction of motion.

At the four ends of the cross are placed the lifting screws. These screws are grouped in pairs, with diameters of 7.60 m. for the lateral pair and 6.40 m. for the longitudinal pair. All four screws turn at the same speed. The screws are mounted in ball bearings on special conical hubs which have sufficient strength to meet the condition where the entire lift load is concentrated on one of the two blades. The transmission consists of four hollow shafts, placed two by two on different levels, and coming from a central cage.

The four screws are driven by a 9 cylinder 120 hp. Rhône engine, which is mounted in the central cage. The engine has been slightly altered to allow it to act with its axis vertical It is supplied by two gas tanks, of a total capacity of 60 liters. When the helicopter tips these reservoirs are automatically isolated from one another.

Gyroscopic Stabilizer

The central portion of the framework contains the stabilizing apparatus, which consists of a gyroscope fixed to the shaft of the motor and turning at a maximum peripheral speed of 130 meters a second. This apparatus assures stability in calm air, and retards oscillations in disturbed air.

The machine is controlled in flight by four variable pitch screws of small size which are mounted on the propeller hubs at right angles with the lifting screws. The pilot can, by means of a control lever, increase or decrease the angle of attack of these blades, and so add or subtract from the thrust of the main screws. This arrangement allows the introduction of righting couples of varying intensity, either to bring the machine to its normal position, when a persistent cause of instability overcomes the resistance of the gyroscope, or to incline the machine purposely to give it motion in a given direction.

As the gyroscope and the engine introduce a reaction couple which it is necessary to overcome, there is provided an air screw with horizontal axis, and having a large leverage. This airscrew is driven by a transmission from the shaft of the forward lifting screw.

The variable pitch auxiliary airscrews permit to incline the machine at will, so that horizontal flight is achieved. This can also be obtained by the action of a tractor propeller placed at the front of the machine.

Horizontal Propulsion and Control

Up to now a fixed pitch tractor has been used, but M. Oehmichen proposes to replace it by a variable pitch propeller. A foot pedal will be used to vary the pitch or to reverse the propeller, furnishing positive or negative thrust, as needed.

M. Oehmichen has found the means not only of directing his helocopter during translatory movement, but also to modify its orientation when stationary. For the translatory movement, he uses a pair of deviating surfaces, placed behind the tractor propeller and worked by a pedal.

For modifying the orientation when the apparatus is stationary two horizontal surfaces are used, placed near the front lifting screw. These surfaces are controlled in the same way as the other two deviating surfaces.

Pedal control will be replaced by a handle fixed to the joystick. The pilot will then be able to control the machine without taking his hand off the control lever.

The landing gear consists of four footballs which are placed in cups of duralumin at the four legs of the framework and of three articulated skids. These footballs and skids are completed by another group of twin footballs placed in front and disposed on a fixed shoe.

The pilot is seated in a simple bucket seat at the back of the machine, with the power plant in front of him. The position is very uncomfortable as the pilot receives the full blast of air from the lifting screws.

The helicopter weighs fully loaded, with the pilot on board, 1870 lb.

International Air Congress, London

The International Air Congress which is to be held on the invitation of the British Government, in London during the week June 25-30 this year under the Presidency of Group Captain H.R.H. the Duke of York, K.G., R.A.F., and of which Lord Weir of Eastwood, P.C., F.R.Ae.S., is Vice-President, and the Duke of Sutherland (Under Secretary of State for Air), Chairman of the Main Committee, is intended to provide opportunities for the reading and discussion of papers on every aspect of air matters. In order that persons more immediately concerned with one aspect of the subject may be able to devote their attention to this particular interest, the Congress will be divided into four Groups (each again divided into sub-Groups) which will meet simultaneously.

Group A will deal with (a) Methods of Research, (b) Aerodynamics, (c) Controllability, (d) Structural Methods, (e) Materials, (f) Alighting Gear.

Group B is sub-divided into sections on (a) Fuels and Lubricants, (b) Motive Power Plant, (c) Airscrews.

Group C will discuss Air Transport and Navigation Problems under the four headings: (a) Technical Aspects, (b) Enginering Problems, (c) Commercial, and Financial Problems, and (d) Medical and Legal Aspects.

Group D will devote itself to (a) Airship Design and Construction and (b) Military utilization of civil personnel and machines.

The reading of these papers will occupy Monday, Wednesday and Friday of the week, while Tuesday and Thursday will be devoted to visits to various places of interest. The Air Ministry have arranged that the Royal Air Force Pageant will take place on the Saturday, June 30.

The qualification for membership is nationality of a country which is represented on the Fédération Aéronautique Internationale or a signatory to the International Air Convention. The Membership subscription has been fixed at £1 (or its equivalent in foreign currency at the date of application) while individuals belonging to the family of a member may join for a reduced subscription of 10s. 0d.

Readers desiring further particulars and a form of application for membership should write direct to Lt. Col. W. Lockwood Marsh, General Secretary, International Air Congress, London, 1923, C/o The Royal Aeronautical Society, 7, Albemarle Street, London ,W.1., England.

"If war were declared to-morrow what would we do for aircraft?"

The Brennan Helicopter

For some time past experiments have been taking place at South Farnborough, England, with the helicopter built for the British air ministry by Louis Brennan the English inventor. These experiments are being conducted with the greatest secrecy, and a like mystery surrounds the constructional features of the machine.

Some time ago an English newspaper made some extravagant claims for the Brennan helicopter, alleging among others that it had risen to several thousand feet height, also making successful horizontal flights. Mr. Brennan promptly denied these assertions, however. The first trustworthy information on the Brennan helicopter was the statement made in the House of Commons, March 22, by Sir Samuel Hoare, British air minister, who declared that satisfactory progress has been made in the experiments with this machine.

In reference to the foregoing the *Daily Chronicle's* aeronautical correspondent writes:

"Though everyone connected with the experiments which have been going on for a long time past at Farnborough with our Government helicopter has been sworn to closest technical secrecy, it is possible none the less to make clear now certain broadly important facts. Louis Brennan, famous as an inventor more especially of the gyroscopic monorail cars, has been the inspirer of this particular research into vertical flight. Already at Farnborough the first experimental man-carrying apparatus, built to designs he has been developing with our official experts, has shown itself capable of rising straight up off the ground carrying not only the weight of the operator but also of an additional useful load of about 250 lb. The position now reached in fact is that the main problems of rising straight up and of hovering are considered solved.

"What secret efforts are now concentrated upon and what will be the key-note of a fresh series of actual flying tests is the balancing and stabilizing of the helicopter after it has left the ground and more especially the prevention of any too abrupt descent should the motive power fail while the machine is up in the air. As a matter of fact the machine which we have been developing officially in collaboration with Brennan is in regard to the provision made for horizontal as well as vertical flight and also in connection with the ingenuity of certain secret mechanism considered to be ahead theoretically and scientifically or experiments conducted elsewhere."

New French Subsidy Schemes

Up to the present the subsidies granted to commercial air services in France have taken the form of subsidies for freight carried and payments according to kilometers traversed and prizes for safety records, says a report received by the Department of Commerce from Commercial Attache Chester L'oyd Jones, Paris. The contracts granted to private companies have heretofore had a maximum duration of ten years. The Sub-Secretary of Aeronautics is now studying plans for extending the concession periods twenty years and providing for exclusive concessions within certain districts or over certain routes, the latter in order to avoid ruinous competition. The routes specially under consideration are those between Paris and London, between Paris and Constantinople, and between Toulouse and Casablanca. During the coming year some of the minor lines heretofore supported will be suppressed.

If legislative support can be secured for the 30-year concessions now under discussion it is hoped also to secure arrangements by which the state guarantees a low rate of interest on the capital invested in exchange for a share in possible profits of operation. This guarantee will not however under the plans now urged involve the abolition of present premiums granted. It is intended in general to bring the aerial companies into substantially the same relations with the state as now apply to the railroads.

Chicago Municipal Airport

A municipal airport is at last an assured fact for the city of Chicago. During the season of 1922 negotiations were begun to secure such a field which would be open to all pilots both local and visitors. A tract of ground consisting of 80 acres (one half mile long and one quarter mile wide) was leased from the city. It was so late in the autumn that nothing was done until recently toward putting the field in shape for landing.

At present a three-ship tent hangar is being erected which was secured from the government and an underground gasoline tank and service pump have already been installed. In a few weeks there will be a small shop, culverts, driveways, stock room, etc., in place ready to service visitors and local flyers.

The municipal airport of Chicago is situated at the South West side of the city, on the North West corner of 63rd St. and Cicero Ave. It is about 25 min. from the downtown district by automobile and has street cars on both the South and East side which takes one to the city in 45 min. There are lunch rooms and other stores adjacent to the field where the visitor may eat and secure the necessary things he may want.

The field is sod and has drainage ditches on two sides which assures safe landings most of the season. Cinder runways will also be established as fast as possible. Extra hangar space will be put up during the season. This field will be operated for anyone who wishes to use it and the army, navy and mail planes will not be charged for landing or storage. A competent man will be in charge at all times and Chicago invites all pilots to use this municipal airdrome.

Several of the local companies have indicated that they will use this field, the Diggins School, the James Levy Co., Chas. Patterson, among others. The two first named companies have affiliated this year and are entering upon their fifth year of operation. They will carry on instruction, passenger flights, photography, sales, cross country, and a general aviation business.

Silcrome Valves

One of the principal causes of engine failures is valve failure due to extreme motor temperatures at which no material was heretofore known to resist indefinitely. The Steel Products Co. of Cleveland, Ohio, after fifteen years of valve manufacturing experience has now produced a new alloy, called Thompson Silcrome, which has withstood all attempts to deteriorate its efficiency at temperatures greatly in excess of those met with in any aircraft engine.

Among the various tests to which this new alloy has been subjected two may be mentioned as being particularly illuminating.

Engineers of a large automobile manufacturing company equipped test cars with Thompson Silcrome valves. The cars were driven 25,000 miles, averaging 400 miles a day, with three shifts of drivers, changing every eight hours. The engines were stopped only for fuel, oil and minor adjustments. The valves were in splendid condition at the end of the test and Thompson Silcrome was adopted as standard equipment.

A 300-hr. test of a 180 hp. Wright E3 airplane motor was conducted under government supervision at Washington, D. C., with the object of determining "endurance characteristics of special experimental features when operated at nine-tenths rated horsepower at rated r.p.m. using gasoline as fuel." The engine was operated with open exhaust on a free air testing stand, using a calibrated club of the pitched tractor type to absorb the power. The engine ran continuously under these conditions for 300 hr., breaking all records for endurance. The previous record was 50 hr. Conclusions of the tests contain this comment: "The performance of the Silcrome tulip valves is highly commendable. The valves retained their shape and did not pit nor stretch. Their condition at the end of the run was perfect." Thompson Silcrome Valves were adopted.

"If war were declared to-morrow what would we do for aircraft?"

Aircraft for Relief Operations

The Air Services of the Army, Navy and Post Office Department have been made available to the American Red Cross for service in its disaster relief operations, according to an announcement made at Red Cross National Headquarters March 16.

Secretary of War Weeks some time ago advised the Red Cross that in case of emergency the Chief of Air Service would at once arrange for the transportation of disaster relief personnel in airplanes to the scene of disaster upon telegraphic request from duly accredited agents of the Red Cross.

Recently, at the suggestion of the National Aeronautic Association, the Red Cross requested similar cooperation by the Navy and Post Office Departments. The Navy Department, through Assistant Secretary Roosevelt, has expressed its willingness to afford transportation by airplane, wherever possible, upon application to the Secretary of the Navy. The Post Office Department has likewise extended the use of its air mail service to the Red Cross under certain conditions. In this connection the service would be in territory adjacent to the transcontinental air mail route running from New York to San Francisco, via Cleveland, Chicago, Iowa City, Omaha, Cheyenne, Salt Lake City and Reno. This service will be given upon telegraphic request to the Second Assistant Postmaster General at Washington.

Division managers of the Red Cross have been instructed to exercise care in originating requests for airplane transportation, which will be used only in cases of unquestioned necessity. The use of the combined air services is expected to be of great assistance to the Red Cross in transporting quickly emergency personnel and supplies to the scene of a disaster.

Sikorsky Forms Company

The Sikorsky Aero Engineering Corp. was chartered March 5, 1923, by the Secretary of State of New York, with a capitalization of $200,000.

The purpose of the corporation is to build, sell and in general exploit the airplanes of I. I. Sikorsky's system. I. I. Sikorsky, who is president of the corporation, is the famous Russian constructor of the first multi-motored airplane in the world, as well as of the first successful large airplane. The other officers of the Corporation are: W. A. Barry, Treasurer; L. A. Shoumatoff, Secretary.

The offices of the corporation are temporarily located at 114 East 25th Street, New York City.

Aero Club of Wisconsin

The Aero Club of Wisconsin has entirely reorganized with the following officers:

President, George W. Browne; honorary vice-president, Brig. Gen. William E. Mitchell; vice-presidents, Walter J. Keenan, Harry Wilson, Walter Davidson, August H. Vogel; treasurer, P. F. Lewis; secretary, Jos. S. Smith; Board of Directors—F. A. Vaughn, Giles Meisenheimer, Rudolf Hokanson, J. B. Mahler, Hugo Schnetzky, L. J. McClurg, Stuart F. Auer and Alfred Perego.

The newly elected president, Mr. Browne, brought the first plane into Wisconsin and established the first flying field in Milwaukee at Cotterel Ave. and Blue Mound Rd. He was western sales manager for the Curtiss Company, and later became general sales manager of the company. He also promoted a successful commercial aeronautical show in the Coliseum of Chicago.

At its annual meeting held on March 12 the Club voted against making a bid for the 1923 National Balloon Race. While the Club would have liked to stage the event, existing conditions precluded any possibility of raising sufficient funds successfully to promote the race.

While the Club has given up the idea of staging a second balloon race, it will, nevertheless, promote a number of contests in the air, calculated to create interest in aeronautics.

New Air Convention

Receipt by the State Department of a report by the Commission of Jurists which met at The Hague last December was followed by an announcement by Secretary Hughes that the Government might initiate action looking toward a treaty or a convention among various nations based upon the report as it effects rules of international law applying to aircraft and radio.

At the present time the report is being studied by State Department officials as a necessary step before it can be put forward as the basis for a formal convention. Inasmuch as the commission was created by the Washington armament conference called by this Government, it was said to be naturally assumed that the United States would take the initiative in proposing a convention.

The report was forwarded by John Bassett Moore, who represented this Government on the Commission of Jurists. Army and Navy officers who attended the conferences in the capacity of technical advisers to Mr. Moore are understood to favor adoption of the decisions reached in convention form by the United States and other powers.

The new Curtiss Metal Pursuit Airplane (400 hp. Curtiss D12 engine) which in a recent trial over a kilometer base, at Mitchel Field, made an average speed of 171 m.p.h.

"If war were declared to-morrow what would we do for aircraft?"

Aviation in Congress

Feb. 11, 1923 — Feb. 24, 1923

Jan. 31 *House.*
Mr. Kahn: a bill (H.R. 14114) to amend the proviso touching qualification as aircraft pilot or observer in Section 13a of the National Defense Act, as amended.

Feb. 14 *Senate.*
Mr. Oddie, from the Committee on Post Offices and Post Roads, to which was referred the bill (S.3084) to authorize and provide for the payment of the amounts expended in the construction of hangars and the maintenance of flying fields for the use of the air mail service of the Post Office Department, reported it without amendment and submitted a report (No. 1143) thereon. Passed the Senate on Feb. 16.
House.
Mr. Fitzgerald: a bill (H.R.14338) to authorize the sale of certain Government property and authorizing an appropriation for permanent buildings and improvements for use of the engineering division of the Air Service of the Army; to the Committee on Military Affairs.

Feb. 15 *House.*
Naval Omnibus Bill (S.4137). Mr. Hicks in a speech calling for the modernization of 13 of our older battleships gives the number of Aircraft carriers owned by U. S., Great Britain and Japan. They are:
1st line. U. S. 2 — Great Britain 1 — Japan 0
2nd line. U. S. 1 — Great Britain 5 — Japan 3

Feb 16. *Senate.*
Bill (S.3064). See above under Feb. 14. Passed the Senate.
House.
Naval Omnibus Bill (S.4137) Sec. 9. Amendment authorizing the Secretary of the Navy to expend $13,000 for acquiring the site of the naval air station at Galveston, Tex., $18,000 for Lakehurst, N. J. $20,000 for Quantico, Va., $58,335 for site at Chatham, Mass. Also authorize the sale of the site at Galveston, Tex. Agreed to.

Feb. 17 *House.*
Senate bill (S.3084) (See above) read and sent to the Committee on Claims.
Mr. Kearns: Committee on Military Affairs. H.R. 14338. A bill to authorize the sale of certain Government property and authorizing an appropriation for permanent buildings and improvements for use of the engineering division of the Air Service of the Army; with amendments (Rept. No. 1640) Referred to the Committee of the Whole House on the State of the Union.

Feb. 22 *House.*
Petition 7396. By Mr. Mead: Petition of Chamber of Commerce of Buffalo, N. Y., supporting the Winslow bill covered by civil aeronautics act of 1923 (H.R. 13715); to the Committee on Interstate and Foreign Commerce.

Feb. 23 *House.*
President signed the bill H.R. 6204. An act to grant the military target range of Lincoln County, Okla., to the city of Chandler, Okla., and reserving the right to use for military and aviation purposes.

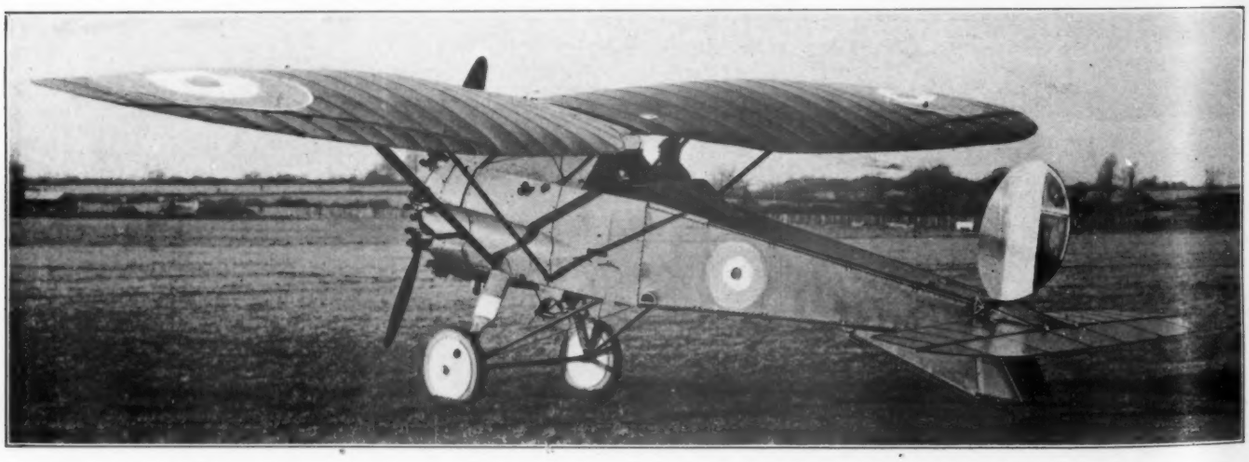
Aeronautical Chamber of Commerce

New Map for Air Navigation

A new type of aerial map, which will prove of great assistance to airmen in making cross country flights, has just been developed under direction of the Chief of Air Service, the details being worked out under the direct supervision of the Airways Section of his office. The main characteristics of this map are as follows:

Rivers are shown in blue; railroads in black, differentiation being made between single track and double track steam lines and electric lines; highways are shown in red, differentiating between the important and the unimportant; towns are blocked in according to shape; a vertical layer system of shading is used to represent the various degrees of altitude, that is, light green being used for country between zero and 500 ft. of elevation, light pink between 500 and 1000 ft., yellow between 1000 and 1500 ft., etc. Overprinted upon the map in purple are small crosses designating the location of landing facilities on which no sketches are available. Small dots in purple represent landing facilities on which sketches of such facilities are found along the border of the map. Where the names of towns are underscored, it means that there is on some large building adjacent to the railroad a large marker giving the name of the town. The work of marking these towns was done from an experimental standpoint by the Engineering Division of the Air Service at McCook Field, Dayton, Ohio.

This map is still in the experimental stage, and a few minor changes are contemplated for additional maps of this nature, that is, highways may be placed in white and the towns blocked in in red, also the compass course and landing field data put on in red. The new type of aerial navigation map which is already completed is that covering the airway between Dayton, Ohio, and Wheeling, W. Va.



Courtesy, British Air Ministry

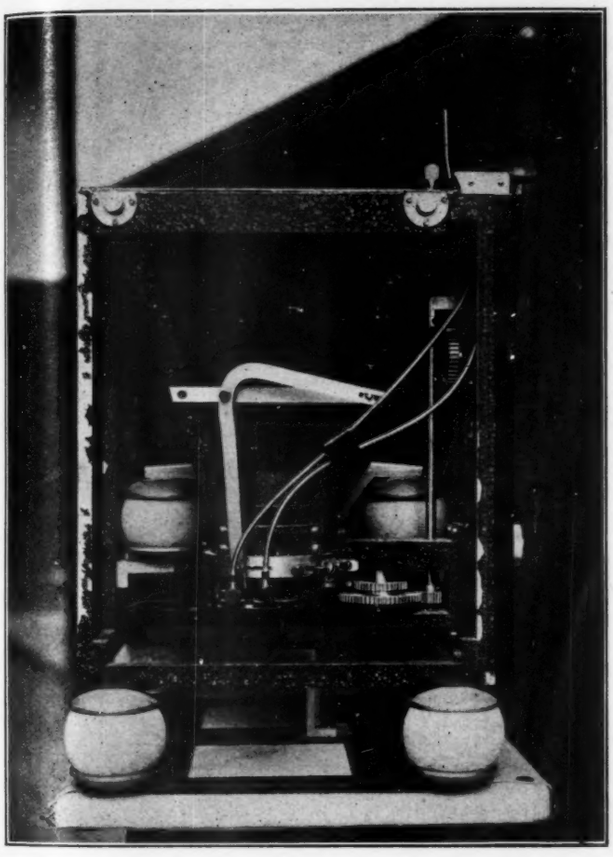
New British Single-Seater Fighter, the Bristol "Bullfinch," fitted with a Bristol Jupiter 400 hp. 9 cylinder radial air-cooled engine

"If war were declared to-morrow what would we do for aircraft?"

The Nistri Aerial Camera

The Nistri Aerial Camera which is illustrated herewith is constructed with interchangeable plate magazines. These magazines can be changed while in flight by an operation taking not longer than five seconds. This is an advantage as with one camera in the plane enough spare magazines can be carried to take any number of photographs. A film magazine is provided which is interchangeable with the plate magazine which will take from 100 to 200 photographs. No special manipulation is required to change from the use of the plate magazine to the film magazine.

The camera can be operated either by hand or automatically by a propeller or wind vane placed on the outside of the



Interior view of the Nistri Aerial Camera

fuselage. Changing from hand to automatic operation is controlled by a lever, and this operation can be carried out with great rapidity should the wind vane fail to function during military operations.

The shutter can be tripped independent from the plate changing operation. This is useful for taking photographs over a particular point.

The control levers are placed on an instrument board in the cameraman's cockpit in such a position that their manipulation will be easy and rapid. For taking pictures automatically at high altitudes, where the interval between the pictures would be longer than at low altitudes, a speed reducing gear is provided. This gear is controlled from the outside of the camera case. In a like manner the diaphragm opening of the lens is controlled from the outside. In order to avoid the cameraman's blunders, a simple device is provided to prevent the slide of the magazine being open before the magazine is attached to the camera and also to prevent the magazine being removed until the slide has been closed.

The camera is made of aluminum bronze and weighs without magazine, about 22 lb. It can be fitted with any lens.

British Torpedo Flying Boat

The Supermarine Aviation Works, Ltd., of Southampton, England, recently completed the construction of a new type of torpedo flying boat for the Royal Air Force, regarding which *L'Aéro-Sports* gives the following particulars.

The boat hull is built of plywood and has two steps. Twenty-six water tight compartments are provided to insure flotation in case of damage to the hull. The bilge pump is actuated by an auxiliary engine of 60 hp. which is mounted in the boat and which also actuates a water propeller for surface navigation. This engine also operates the dynamos for lighting the boat and starting the engines, and it actuates besides a small winch for hoisting the 125 lb. anchor.

The wings are of triplane form and they constitute a unit which can be removed from the hull by removing a certain number of bolts. The engine mountings are incorporated in the wing unit. The wings have wooden frames, and the upper and middle wings are fabric covered, while the lower wing, which is 10 ft. above the water line, is entirely covered with plywood.

The following specification is available:
Span, top and middle wings, 16.46 m.
Span, bottom wing, 14.02 m.
Overall length, 9.15 m.
Maximum height, 7.62 m.
Total wing area, 112 sq. m.
Engines, two 600 hp. Rolls-Royce "Condor".
Gross weight, 9525 kg.

The Supermarine torpedo flying boat can carry sufficient fuel for a 1000 mile flight, or it can carry two 3000 lb. automobile torpedoes for a flight of less distance. The protective armament comprises five machine guns, disposed as follows: one forward in a gun ring, three amidships on a platform situated on the boat aft of the wings, and one aft, near the biplane tail.

The Royal Air Force has for some time been experimenting with large ocean going flying boats, none of which is believed to have so far passed the experimental stage. Among these boats there may be recalled the Felixtowe "Fury" (five Rolls-Royce "Eagle" 375 hp. engines), the Vickers "Valentia" and the Short "Cromarty" (both fitted with two Rolls-Royce "Condor" 600 hp. engines), and the Fairey "Titania" (four "Condor" engines).

War-Time Fraud Cases

By direction of the President a Special Board of the War Transactions Section of the Department of Justice, to be known as the Board of Survey, was appointed Feb. 23 to cooperate with a similar organization created in the War Department in making a survey of the transactions involved in or growing out of the late war.

The following officers of the Department will constitute said Board of Survey:

The members of the Advisory Council, Judges Keer and Bigger;

The Chief of the Sub-division of the War Transactions Section in Charge of Aviation, Meier Steinbrink;

The Chief of the Sub-division of the War Transactions Section in charge of Camps and Cantonments, Roscoe C. McCulloch;

The Chief of the Sub-division of the War Transactions Section in charge of Quartermaster Contracts, C. Frank McCulloch;

The Chief of the Sub-division of the War Transactions Section in charge of Ordnance and Foreign Contracts, Henry W. Anderson.

The Board appointed by the Secretary of War is composed of the following: The Assistant Secretary of War, Chairman; The Quartermaster General, The Chief of Engineers, The Chief of Ordnance, The Chief of Air Service, The Chief of Finance, Col. J. A. Hull, Judge Advocate.

First Lieut. Earl H. DeFord, A.S., Kelly Field, has been directed to report to the Judge Advocate.

"If war were declared to-morrow what would we do for aircraft?"

ARMY AND NAVY AIR NEWS

U. S. Army Air Service

Army Orders—First Lieut. Louis C. Simon, jr., A.S., from Maxwell Field, Montgomery, Ala., to Selfridge Field.

Capt. George H. Schumacher, Q.C., appointed constructing quartermaster, Middletown, A.I.D.

First. Lieut. Howard E. Pulliam, 31st Inf., detailed to Air Service, at Brooks Field.

Sec. Lieut. Charles L. Williams, Inf., transferred to Air Service, at Chanute Field.

Maj. Augustine W. Robins, A.S., from Fairfield A.I.D. to command Wilbur Wright Field.

Sec. Lieut. Kenneth F. Pughe, A.S., transferred to Infantry.

First Lieut. Richard Orleans Hunnam, A.S., absent from duty for more than three months without leave is dropped from the rolls of the Army.

Capt. Carl Spatz, A.S., promoted to rank of Major. He will remain at Selfridge Field.

First Lieut. Victor H. Strahm, A.S., from Brooks Field to Middletown A.I.D., Pa.

First Lieut. Robert H. Finley, A.S., from Kelly Field to Langley Field on completion of course at Yale University.

Wrt. Off. John Shepard from Americus A.I.D. to Maxwell Field.

First Lieut. Earle H. Tonkin, A.S., from March Field to Crissy Field.

* * *

Unsuccessful Attempt at Duration Record—An unsuccessful attempt was made on March 30 by Lieuts. Oakley G. Kelly and John A. Macready, A.S., to beat with the Army Fokker T2 the existing world's duration record of 34 hr. 15 min. 7 sec. which was established by the French pilots Bossoutrot and Drouhin. The two pilots took off from Wilbur Wright Field, Dayton, Ohio, in a biting gale at 4.15 in the afternoon, Lieutenant Kelly being in the pilot's cockpit. After flying throughout the night and part of the following day the big monoplane was forced to make a landing on account of engine trouble, at Wilbur Wright Field at 12.05 a. m., March 31.

This was the third attempt made by Lieutenants Kelly and Macready to bring back to America the duration record. The first attempt was postponed due to a sudden change in the weather, and the second attempt owing to the softness of the ground at Wilbur Wright Field, the heavily loaded Fokker being unable to climb off the ground after running practically the whole length of the field.

Kelly and Macready's latest attempt was made over a triangular course measuring 50 kilometers, as it was the intention of the Air Service to establish speed records for 1000, 1500, 2000, 3000 and 4000 kilometers at the same time as the world's maximum duration record.

* * *

Fast Cross-Country Flight—A remarkably high speed was made during a flight from Nogales, Ariz., to Fort Bliss, Tex., by Maj. Leo G. Heffernan piloting DH4B airplane with Sergeant Jensen as observer. They covered the distance of 75 miles from Columbus, N. M., to Fort Bliss in 18 min., an average speed of 250 m.p.h.

The flight from Columbus to Fort Bliss was made in a blinding sand storm, the air being saturated with sand to a height of 6000 ft. Major Heffernan endeavored to climb above the sand after leaving Columbus but was unable to do so on account of the velocity of the wind and the shortness of the flight. He made a safe landing on the Fort Bliss Airdrome.

Pulitzer Race Winner Receives Involuntary Bath—While on a mission of photographing certain western harbors, a task assigned to the 15th Photo Section at Crissy Field, Lieut. Russell L. Maughan, A.S., with Private Carlow as photographer, encountered trouble as they neared Eugene, Ore. A combination of low fog and engine trouble forced Lieutenant Maughan to land in the river. The plane turned over on its back, shooting Carlow some fifty feet through the air, but Carlow lit swimming, and the only casualties were maps, camera and clothing.

Carlow, upon being interviewed, stated in part: "Of course, my new thirty-five dollar civilian overcoat went down the river, while my —— —— O.D. blouse stuck to the tail of the ship." Lieutenant Maughan stated that after turning over he had the choice of either diving down around the cowling to get out or staying upside down in the cockpit. Needless to say, he dove.

The next day Lieutenant Goldsborough, with Sergeant Kutz as photographer, who started out from Crissy Field as the second section of the expedition, landed at Yon Calla, where he heard of Lieutenant Maughan's accident and went back to his assistance. All hands returned to Crissy Field to wait for new equipment and maps.

* * *

Supreme Court Reverses Flying Pay Decision—The Supreme Court of the United States on March 19 reversed the decision of the Court of Claims on the famous Rider case, which claim was for 50 per cent additional flying pay based on the pay of candidates for a commission. This will affect hundreds of young men who were in the Air Service during the war, many of whom have filed their claim for this money.

In February of 1922 the Court of Claims rendered a favorable decision in the case of Nelson W. Rider. The Government later appealed this decision to the United States Supreme Court, which reversed this decision on the above-mentioned date and sustained the Government in its contention that such men were not entitled to this additional flying pay.

In this connection it might be stated that flying cadets now in training receive $75 per month, which includes flying pay; that is, they do not receive any pay in addition to the $75 for the flying risk.

* * *

Ten Airmen Take Flight in Airship D2—Carrying Col. C. G. Hall. Maj. J. A. Pagelow, Capt. L. F. Stone, Lieuts. C. P. Clark, H. H. Holland, Philip Schneeberger, A. C. McKinley, R S. Heald, and two engineers, the Army Airship D2 recently made a short flight from Scott Field to White Church, near Baldwin, Ill., and return.

The ship was in the air 1 hr. 37 min. and covered a distance of 60 miles. The average altitude of the flight was 1200 ft., and the average speed 37 m.p.h.

The trip was made for the purpose of instructing student pilots and in order to observe meteorological conditions in the vicinity of the Kaskaskai River.

* * *

General Patrick Inspects Scott Field—Maj. Gen. Mason M. Patrick, Chief of Air Service, recently visited St. Louis, Mo., and spent several days there inspecting proposed sites for the 1923 Pulitzer Trophy Races. He also inspected Scott Field, Belleville, Ill.

The intended trip in an airship and the inspection of the camp from the air had to be cancelled on account of the General's ill health.

"If war were declared to-morrow what would we do for aircraft?"

Official Photo, U. S. Army Air Service

Glider produced by the Engineering Division, Air Service which has just been tested at McCook Field

McCook Field Developes Target Glider—The Target Glider which is illustrated on the front cover of this issue, was developed by the Engineering Division of the Air Service for use on flying fields where training in aircraft gunnery is given. As may be seen from this illustration, the Target Glider is fastened to the top wing of an airplane, and it is released in flight when it will descend to the ground at a speed of about 30 m.p.h., affording a realistic target for anti-aircraft and airplane guns.

The target glider has a wing span of 12 ft. 6 in. an area of 18 sq. ft., and weighs 23 lb. This size was decided upon because it presents as much surface to the gunner as the vital spot of a full-size airplane. The speed at which the glider descends may be regulated by change of weight or manipulation of tail surfaces. It can even be adjusted before being released to loop or spiral.

The target glider and the release mechanism were tested for the first time at McCook Field on March 1. A run was made without leaving the ground up to about 40 m.p.h. to make sure that the target glider wings or tail did not flutter. Then the airplane rose into the air and the glider was released at about 20 ft. altitude. Owing to the down wash which occurs above the upper wing of a JNH airplane at climbing incidence, the target glider, which was attached to it, did not leave its support until the pilot was requested to come down, when the glider promptly raised into a stall about 30 ft. above the releasing point and then fell into a dive from which it was about to recover when it struck the ground.

The experiment showed that up to speeds reached in the test flight, flutter of the glider does not occur; that even when released with insufficient incidence it can be made to leave the airplane without danger of fouling; that a greater altitude is necessary in order to give it a chance to recover normal glide; that the release latch is satisfactory, and that about five inches should be cut from the glider tail to assure sufficient incidence for a prompt get-away when released.

* * *

Gliding in Army Air Service—Three series of tests of the GL2 monoplane glider were recently made at McCook Field. Much more favorable results probably would have been achieved had these trials been made at a place more adapted for motorless flight, since the topography of the country around Dayton is extremely flat. In these trials it was necessary to utilize a catapult to give the glider flying speed.

The best results thus far recorded were obtained on the second day of the tests. With a wind of from 5 to 15 m.p.h., the take-off required only about 15 ft., and the flights reached an altitude of 12 ft. and were about 300 ft. in length. The controls appeared to answer perfectly.

On the third series of tests the glider did not leave the ground, due to the fact that there was absolutely no wind. The landing gear and instruments were then removed from the glider, reducing its weight by 40 lb. Lieutenants Brookley and Pearson each made one run, the glider being supported only on its main skid. These tests proved that a single skid is sufficient for a take-off, the glider not losing its equilibrium until it reached a state of rest.

The glider, both because of its economy and simplicity of construction, has an appeal for sportsmen to whom the ownership of an airplane would be an impossibility on account of its high cost. In learning to operate the glider, these men are gaining experience which would be invaluable to them as airplane pilots, and which would make their training as such a comparatively easy matter for the government.

For this reason, and also because it appears unwise to neglect a phase of development in which other countries are making rapid strides, the Army Air Service is conducting these very limited tests. Further experiments are to be made and interesting results may be expected.

* * *

Anti-Aircraft Artillery Goes to Philippines—The 60th Artillery (Anti-aircraft) Battalion, U.S.A., now at Fort Crockett, Tex., has been designated for service in the Philippine Islands. It is the intention of the War Department by means of transfers and assignment or recruits to bring the battalion to a strength of 400. The necessary additional commissioned officers will be ordered to join the battalion in New York and San Francisco.

Coming Aeronautical Events

AMERICAN

May 30 — *Fifth Annual Aircraft Exhibition, Flying Club of Baltimore, Logan Field, Dundalk, Md.*

June or July — *National Balloon Race.*

Oct. 1-3 — *National Airplane Races, St. Louis, Mo.*

Late Fall — *Curtiss Marine Flying Trophy Race.*

FOREIGN

May 13 — *Grand Prix (Balloons), Paris, France.*

June 25-30 — *International Aero Congress, London..*

July 20- *Aug.* 12 — *International Aero Exhibition, Gothenburg, Sweden.*

Aug. 3-31 — *Sailplane Meet, Rhoen, Germany.*

Aug. 5-26 — *Sailplane Meet, Vauville, near Cherbourg, France.*

Sept. 28 — *Schneider Maritime Aviation Trophy Race, Cowes, Isle of Wight, England.*

Dec. 1 — *Entries close for French Engine competition.*

"If war were declared to-morrow what would we do for aircraft?"

Marking the Airways from Washington to New York—The Air Service contingent at the Aberdeen Proving Grounds, Md., propose to mark eight landing fields on the Model Airway Route from Washington to New York. Weather permitting, this will be completed very shortly. The fields will be marked by the circular identification marker, fifty feet in diameter, with a border four feet wide of the best cheese cloth obtainable, which will be pegged to the ground.

U. S. Naval Aviation

Naval Orders—Lieut. Fred M. Byers, det. Nav. Air Sta., Coco Solo, C. Z.; to Aire. Sqds. Battle Fleet.

Lieut. Isaac Schlossbach, det. Aire. Sqds. Scouting Fleet; to Nav. Air Sta. Coco Solo, C. Z.

Lieut. j. g. Robert P. Erdman, det. Nav. Air Sta. Pensacola, Fla.; to Rec. Ship New York.

Lieut. j. g. Benjamin P. Ward, det. Nav. Air Sta. Pensacola, Fla.; to U.S.S. Macfarland.

Ens. Charles E. Bauch, det. Bu. Aer., Navy Dept.; to Nav. Air Sta. Lakehurst, N. J.

Lieut. John B. Lawrence, det. Nav. Air Sta. Hampton Roads, Va.; to Bu. Aer. Navy Dept.

Lieut. Stuart A. Maher, det. Nav. Air Sta. Pensacola, Fla.; to conn. f.o. U.S.S. Richmond and on board when commissioned.

Lieut. j.g. Oliver W. Gaines, det. Nav. Air Sta. Pensacola, Fla.; to Destroyer Squadrons, Scouting Fleet.

Lieut. j.g. Justin D. Hartford, det. Nav. Air Sta. Pensacola, Fla.; to con. f.o. U.S.S. S-12

Lieut. j.g. Carroll L. Tyler, det. Nav. Air Sta. Pensacola, Fla.; to Rec. Ship New York.

Ens. Edgar C. Suratt, det. U.S.S. Mercy; to Nav. Air Sta. Pensacola, Fla.

Lieut. j.g. Laurence W. Curtin, to Aire. Sqds., Battle Fleet.

Lt. Comdr. Francis T. Chew, det. Nav. Air Sta. San Diego, Calif.; to command U.S.S. Capella.

Lt. Comdr. Wallace L. Lind, det. U.S.S. Capella; to command Nav. Air Sta. San Diego, Calif., as exec. officer.

Lieut. William J. Hart, det. Off. Gen. Inspector of Nav. Aircraft East Dist. Garden City, L. I., to Inspector of Nav. Aircraft, Curtiss Aeroplane & Motor Corp., Garden City.

Lieut. Linton Herndon, det. Rec. Ship New York; to instruction inspection of Nav. Aircraft, Garden City, L. I.

Lieut. Roy K. Jones, det. Rec. Ship New York; to instruction inspection of Nav. Aircraft, Garden City, L. I.

Lieut. Telford B. Null, det. Nav. Air Sta. Hampton Roads, Va.; to Nav. Air Sta. Lakehurst, N. J.

Ens. George A. Cahill, det. Nav. Air Sta. Hampton Roads, Va.; to U.S.S. Proteus.

Lieut. Nicholas A. Brown (C.C.), to Nav Air Sta. Hampton Roads, Va., as disbursing and commissary officer.

Lieut. Louis Haase, det. Inspector Nav. Aircraft, Curtiss Aeroplane & Motor Corp., Garden City, L. I.; to Inspector Nav. Aircraft, Davis-Douglas Co., Santa Monica, Calif.

Lt. Comdr. Frederic T. Van Auken, det. U.S.S. Maryland; to Nav. Aircraft Factory, Philadelphia, Pa.

Lieut. Frank W. Wead, det. Aire. Sqds. Battle Fleet; to Bu. Aer. Navy Dept.

Lt. Comdr. Charles R. O'Leary (C.C.), det. Bu. Supplies and Accounts; to supply officer, Aire. Sqds. Scouting Fleet.

* * *

Aviation Training in Navy—The next class in Naval Aviation Training will start on July 1, at the Pensacola Naval Air Station, according to a recent announcement by the Navy. Applications for such training must reach the Department by May 1, it is stated.

Commanding officers of various ships and stations are urged by the Bureau of Navigation to encourage all officers who are eligible for and who desire this duty to submit applications. The Department is desirous of increasing the number of officers on aviation duty to the point where it will be possible to release for general duty those officers who have been held in aviation for the longest periods.

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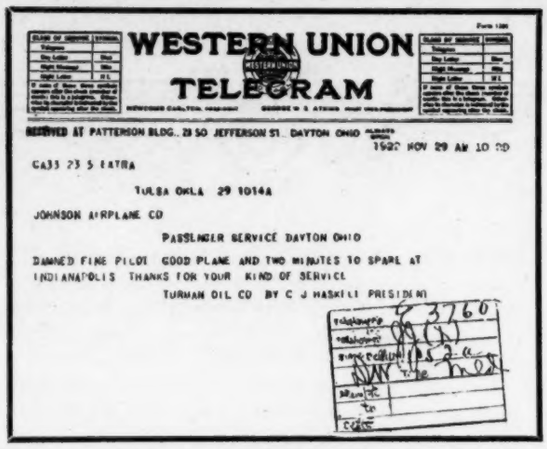

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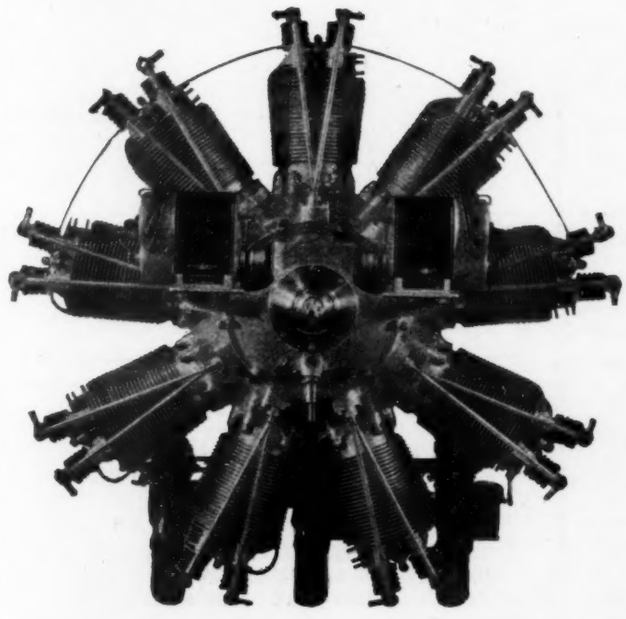

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County of New York } ss.
State of New York }

Before me, a notary public in and for the State and county aforesaid, personally appeared Geo. Newbold, who, having been duly sworn according to law, deposes and says that he is the Business Manager of AVIATION and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are;

Publisher, The Gardner, Moffat Co., Inc., Highland, New York; Editor, Ladislas d'Orcy, 225 Fourth Ave., New York City; Managing Editor, none; Business Manager, Geo. Newbold, 225 Fourth Ave., New York City.

2. That the owners are (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.)

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Sworn to and subscribed before me this 19th day of March 1923.
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